

REMARKS

The Office Action dated May 11, 2006 has been carefully reviewed. Claims 1-13 and 15-21 are pending. Claim 14 was previously cancelled. Reconsideration of the grounds of rejection is respectfully requested in view of the following remarks.

Summary of the Office Action

Claims 1-5, 7, 9-13, and 16 are rejected under 35 U.S.C. §102(e) as being anticipated by Lenaerts (U.S. Patent No. 6,607,748).

Claims 1-10, 12, 13, and 15-21 are rejected under 35 U.S.C. §103(a) as unpatentable under WO 02/12414 (WO '414) in view of Chesser (U.S. Patent No. 6,933,262).

Response to Office Action

A. Rejection of Claims 1-5, 7, 9-13, and 16 under §102(e)

The Examiner has rejected claims 1-5, 7, 9-13, and 16 as being anticipated by Lenaerts. In response to the Examiner's rejection, the applicants respectfully submit that Lenaerts fails to disclose each and every limitation of the claims. "A claim is anticipated only if each and every element as set forth in the claims is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987).

In the present invention, Claim 1 includes an aqueous drilling fluid containing a biopolymer other than starch, and a starch polymer having a content of amylose of at least 50% by weight, wherein the starch is present at a concentration of at least 2,500 mg/L, and wherein the starch polymer is modified with at least one of carboxymethyl groups and hydroxypropyl groups.

Claim 10 includes an aqueous drilling fluid for drilling an oil or gas well comprising water, starch, a biopolymer other than starch, and at least one of brine and clay, wherein the starch is a high amylose content starch polymer having a content of amylose of at least 50% by weight, wherein the starch is present at a concentration of at least 2,500 mg/L, and wherein the starch polymer is a modified starch polymer, the modification being obtained by a process selected from the group consisting of carboxymethylation and hydroxypropylation.

Applicants respectfully assert Lenaerts does not teach or suggest the underlined features set forth in the above paragraphs.

The Examiner states that Lenaerts teaches a crosslinked high amylose starch containing 70% amylose, which is used to form a tablet, and that tablet may contain various biopolymers, including xanthan and celluloses, and clays. The Examiner asserts that the present invention is anticipated by Example 7 of Lenaerts, which teaches the dissolution of a tablet in a medium. Applicants respectfully submit that significant differences exist between the composition of Lenaerts' Example 7 and the drilling fluid of the present invention.

As amended, the claimed drilling fluid contains at least 2,500 mg/L of starch. Example A in the present application is representative of the claimed invention and discloses an aqueous fluid with a starch concentration of 4.0 lbs/bbl, which converts to approximately 11,000 mg/L. Example 7 of the cited reference Lenaerts, however, discloses the dissolution of a tablet in a medium, resulting in a starch concentration of approximately 750 mg/L. Lenaerts clearly does not teach the drilling fluid of the claimed invention.

The starch concentration is important to a composition's function as a drilling fluid, since the drilling fluids of the present invention provide efficient fluid loss control at the disclosed levels of starch concentration. As illustrated in Table 3 of the application, the drilling fluid compositions show lower viscosity build and filtrate reduction with increasing concentration of starch. With the low starch concentration disclosed, the composition of Lenaerts' Example 7 could not function as a drilling fluid.

Similarly, the presence of amylase in the Lenaerts' composition renders it unsuitable for use as a drilling fluid. Example 7 cites that, when combined, the components of the Lenaerts composition react to form a composition which is different from the claimed invention. Specifically, the enzyme amylase cleaves the linkages of the amylose to form dextrin, maltose, or glucose. Once the tablet containing the amylose starch is dissolved in the medium of Example 7, the amylase begins to decompose the amylose. As a result, the solution of Example 7 contains a constantly decreasing amount of the component amylose. Since the presence of the amylose in the composition is necessary for fluid loss control and low viscosity build, Lenaerts composition could not function as a drilling fluid. Lenaerts clearly cannot be said to teach the drilling fluid of the claimed invention.

Accordingly, because the reference as suggested by the Office fails to provide each and every claim limitation, applicants submit that the rejections Claims 1 and 10 have been overcome, and applicants respectfully request withdrawal of the rejections.

Similarly, dependent Claims 2-5, 7, 9, 11-13, and 16 depend from allowable independent Claims 1 and 10. Therefore, for at least the reasons noted above, Claims 2-5, 7, 9, 11-13, and 16 are allowable because they depend from an allowable base claim.

B. Rejection of Claims 1-10, 12, 13, and 15-21 under §103(a)

The Examiner has rejected claims 1-10, 12, 13, and 15-21 as unpatentable under WO 02/12414 (WO '414) in view of Chesser (6,933,262). Applicants assert that it is well established that the prior art reference (or references when combined) must teach or suggest all the claim limitations, see, e.g., MPEP § 2142. In response to the Examiner's obviousness rejection, the applicants respectfully assert that the pending claims are allowable over the cited reference because the reference does not teach or suggest every claim limitation.

In the present invention, Claim 1 includes an aqueous drilling fluid containing a biopolymer other than starch, and a starch polymer having a content of amylose of at least 50% by weight, wherein the starch polymer is modified with at least one of carboxymethyl groups and hydroxypropyl groups.

Claim 10 includes an aqueous drilling fluid for drilling an oil or gas well comprising water, starch, a biopolymer other than starch, and at least one of brine and clay, wherein the starch is a high amylose content starch polymer having a content of amylose of at least 50% by weight, and wherein the starch polymer is a modified starch polymer, the modification being obtained by a process selected from the group consisting of carboxymethylation and hydroxypropylation.

Claim 17 includes a well drilling process comprising the step of providing an aqueous drilling fluid comprising a mixture of brine, clay and a fluid loss polymer to a bore hole, the improvement comprising that the aqueous drilling fluid includes a biopolymer other than starch, and at least a portion of the fluid loss polymer is a high amylose content starch polymer having a content of amylose of at least 50% by weight, wherein the starch polymer is modified with at least one of carboxymethyl groups and hydroxypropyl groups.

Applicants respectfully assert WO '414 does not teach or suggest at least the underlined features set forth in the above paragraphs.

WO '414 teaches a drilling fluid which comprises a high amylose starch. The Examiner reasons that "starch is a biopolymer and thus satisfies the requirements of the claim."

Applicants respectfully submit that starch is not a biopolymer. A biopolymer is defined as “a water-soluble polymer resulting from the action of bacteria on carbohydrates.” Hawley’s Condensed Chemical Dictionary, 14th Ed., Richard J. Lewis, Sr., John Wiley & Sons, Inc., New York, 2001. Starch is defined as “a carbohydrate polymer and . . . occurs as a reserve polysaccharide in plants (corn, potatoes, tapioca, rice, and wheat are commercial sources).” *Id.* Since starch is not a biopolymer, WO ‘414 does not “satisfy the requirements of the claim” because it does not disclose the use of a biopolymer.

The use of both terms, biopolymer and starch, in close proximity in the same claim also supports the applicants’ argument that the terms should be given different meanings. If two terms are described a single element, one would expect the claim to consistently refer to this element with one or the other of the two terms, but not both, especially within the same clause. *Ethicon Endo-Surgery, Inc. v. United States Surgical Corp.*, 93 F.3d 1572, 1579 (Fed. Cir. 1996). In *Ethicon*, the court construed the meaning of claim terms “pusher bar” and “pusher assembly” which were both found in the claim at suit. The court determined that “pusher bar” and “pusher assembly” were not synonyms. Likewise in claims 1, 10, and 17, “biopolymer” and “starch” are not synonyms.

Additionally, the amendments to independent claims 1, 10, and 17 further distinguish the pending claims from the references. WO ‘414 discloses only the use of starch. It does not disclose the use of starch with a biopolymer which is not starch.

Because WO ‘414 contains no teaching or suggestion that a biopolymer other than a starch can be used in the drilling fluid in combination with the starch, Claims 1, 10, and 17 are patentable over WO ‘414 in view of Chesser.

Claims 2-9, 12, 13, 15, 16, and 18-22 depend from independent Claims 1, 10, and 17. Therefore, for at least the reasons noted above, Claims 2-9, 12, 13, 15, 16, and 18-22 are allowable because they depend from an allowable base claim.

CONCLUSION

In view of the foregoing remarks, it is submitted that pending claims 1-13 and 15-22 are in condition for allowance. Accordingly, reconsideration and timely allowance of claims 1-13 and 15-22 are requested.

The Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. §§ 102(e) and 103(a) presented in the Office Action mailed May 11, 2006.

The Commissioner is hereby authorized to charge any fee due in connection with this filing to Deposit Account **50-0310**.

Respectfully submitted,

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Date

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